

Docket #71268

BEARING FOR WHEEL SUSPENSIONS IN A MOTOR VEHICLE

REFERENCE TO RELATED APPLICATION

[0001] This application claims foreign priority benefits under Title 35, United States Code § 119 of German application DE 103 02.413.1, the content of DE 103 02.413.1 is hereby incorporated by reference.

5 FIELD OF THE INVENTION

[0002] The present invention pertains to a bearing for wheel suspensions in a motor vehicle, comprising a metallic housing with a pot-shaped vertical section, a rubber buffer arranged in the said housing, and a carrier piece, which can be connected to a piston-and-cylinder unit and is fixed in the rubber buffer.

BACKGROUND OF THE INVENTION

[0003] Shock-absorbing strut bearings have already been known (e.g., DE 30 32 199 C1, EP 0 816 140 B1), in which a rubber buffer is arranged in a pot-shaped, metallic housing, wherein the shock absorber is fixed with a carrier piece arranged in the rubber buffer. The drawback of these is that the rubber buffer is pretensioned between two flat surfaces, so that this pretensioning acts directly on the rubber spring and the rubber spring is compressed in the process. The possible path of deformation of the rubber buffer is reduced by the compression of the rubber spring, so that the insulation potential for the vibration absorber decreases.

SUMMARY OF THE INVENTION

[0004] Based on this, the object of the present invention is to provide a bearing in which a rubber buffer is arranged in a pot-shaped metallic housing in such a way that when the bearing is fastened to the body, the rubber buffer is not pretensioned in such a way that a negative effect will occur on the insulation and the absorbing properties of the piston-and-cylinder unit.

[0005] Piston-and-cylinder units are defined, for example, as vibration absorbers, shock-absorbing struts or self-pumping shock-absorbing structures with level control.

[0006] To accomplish this object, provisions are made according to the present invention for a reinforcing part, which is supported axially and/or radially at the inner wall of the housing, to be arranged in the rubber buffer. The rubber buffer is divided into a damping buffer and a

pretensioning buffer.

[0007] Provisions are advantageously made according to an embodiment of the invention for the reinforcing part to be arranged in the housing extending in an annular pattern, but other geometric shapes are conceivable as well.

5 **[0008]** Provisions are made in another embodiment for the annularly extending reinforcing part to have a decreasing internal diameter starting from the housing.

[0009] It is advantageous according to an embodiment of the invention for the pretensioning to be absorbed with an additional rubber layer of the rubber buffer due to the bearing being screwed (connected) to the body of the vehicle, such rubber layer being supported
10 via the metal reinforcement toward the outside on the housing of the bearing. A partial support is also conceivable. The rest of the rubber buffer is not affected, so that the piston-and-cylinder unit with its fastening to the inner part is movable axially and/or radially and/or cardanically and is supported or damped by this part of the rubber buffer in the upward and downward directions.

[0010] Provisions are made in another embodiment for the carrier piece received in the
15 rubber buffer to be arranged axially movably. It is advantageous in this connection for the carrier piece to be completely embedded in the rubber buffer, which is decisive for the damping.

[0011] Provisions are made in the embodiment of the present invention for the rubber

buffer to be dimensioned such that the tensioning buffer protrudes from the pot-shaped housing. It is advantageous in this connection for the protruding part of the tensioning buffer to bring about a pretensioning during the tensioning of the housing in relation to the vehicle body, but this pretensioning is supported at the inner wall of the housing via the reinforcing part and thus it does not affect the lower part of the rubber buffer, which said lower part has the inner part.

[0012] Simple fastening of the piston-and-cylinder unit at the bearing is provided by the rubber buffer, the carrier piece and the housing being provided with a through hole for fastening the piston-and-cylinder unit. However, the thread of the piston rod may also be screwed directly into the inner part.

[0013] The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its uses, reference is made to the accompanying drawings and descriptive matter in which preferred embodiments of the invention are illustrated.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] Figure 1 is a schematic partially sectional view showing a preferred exemplary embodiment according to the present invention;

[0015] Figure 2 is a schematic partially sectional view showing another preferred exemplary embodiment according to the present invention;

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] Referring to the drawings in particular, the bearing 7 shown in Figure 1 is connected via the screw connections 8 with the vehicle body 10 (e.g. the chassis) of a motor vehicle, while the piston rod 9 of the piston-and-cylinder unit 6 is received and fixed in the bearing 7.

[0017] The rubber buffer 1 is first accommodated in the pot-shaped housing 3 of the bearing 7, and the upper area is supported as the tensioning buffer (a tensioning buffer portion) 1b of the rubber buffer 1 at the inner wall 4 of the housing 3 via the reinforcing part 2. The inner part 5 is embedded in the damping buffer (damping buffer portion) 1a of the rubber buffer 1 in the lower part of the rubber buffer 1, and permits the fixation of the piston rod 9 at the inner part 5 due to the corresponding through holes of both the rubber buffer 1, of the inner part 5 and of the housing 3.

[0018] Due to the inner part 5 being embedded in the rubber buffer 1, the piston-and-cylinder unit 6 or the piston rod 9 is enabled to allow the inner part 5 to perform axial and/or radial and/or cardanic movements in relation to the rubber buffer 1 by the corresponding adjacent parts of the rubber buffer 1 being compressed and released by the inner part 5.

[0019] Due to this type of fastening, the rubber buffer 1 is received in the upper area with a pretensioning between the vehicle body 10 and the housing 3 of the bearing 7, while the piston-

and-cylinder unit 6 is not affected by the pretensioning whatsoever, so that a favorable uncoupling or insulation of vibrations can be performed by the rubber buffer 1. Moreover, a harder cardanic characteristic is also produced besides the reduction of the path of deformation and the insulation potential.

5 **[0020]** The bearing 7 shown in Figure 2 is similar in design to the bearing 7 of Figure 1. The bearing 7 is connected via the screw connections 8 with the vehicle body 10 (e.g. the chassis) of a motor vehicle, while the piston rod 9 of the piston-and-cylinder unit 6 is received and fixed in the bearing 7.

10 **[0021]** The rubber buffer 1 is first accommodated in the pot-shaped housing 3 of the bearing 7, and the upper area is supported as the tensioning buffer 1b of the rubber buffer 1 at the inner wall 4 of the housing 3 via the reinforcing part 2. The inner part 5 is embedded in the damping buffer 1a of the rubber buffer 1 in the lower part of the rubber buffer 1, and permits the fixation of the piston rod 9 at the inner part 5 due to the corresponding through holes of both the rubber buffer 1, of the inner part 5 and of the housing 3.

15 **[0022]** The reinforcing part 2 can be used at the same time to strengthen the body in this area. The tensioning buffer 1b can be inserted as a sealing part between the vehicle body and the housing.

[0023] The inner part 11 of the inner part 5 in the left-hand half of the bearing 7 shown in Figure 2, is not distinctive in the embodiment of Figure 2 (it is shorter radially at one side as compared with inner part 5 of the embodiment of Figure 1) . With this alternative construction, there is a different cardanic softness.

5 **[0024]** A damping function and/or an uncoupling function can also be achieved both with the tensioning buffer 1b of the embodiment of Figure 1 and with the tensioning buffer 1b of the embodiment of Figure 2.

[0025] The lower area of the damping buffer 1a could also be supported at the bottom of the housing 3.

10 **[0026]** While specific embodiments of the invention have been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.